PRICE 15¢

PERIODICAL ROOM
GENERAL LIBRARY
UNIV. OF MICH.

JAN 14 1936

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •

JANUARY 11, 1936

New President, A.A.A.S.

See Page 29

A SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

VOL. XXIX *No. 770*

The Weekly Summary of

Current Science

Published Every Saturday by

SCIENCE SERVICE

THE INSTITUTION FOR THE POPULARIZATION OF SCIENCE organized 1921 as a non-profit corporation, with trustees nominated by the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science, the E. W. Scripps Estate and the journalistic profession.

Edited by WATSON DAVIS .

Subscription rates—$5.00 a year postpaid; two years $7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

Canadian subscribers please add 50 cents a year, foreign subscribers 75 cents a year to regular subscription rate to cover postage.

Members of the American Association for the Advancement of Science have the privilege of subscribing to SCIENCE NEWS LETTER at the reduced price of $3 per year. Application for this privilege should be accompanied by privilege card obtained from the Permanent Secretary, A.A.A.S., Smithsonian Institution Building, Washington, D. C.

In requesting change of address, please give your old address as well as the new one in notification to Circulation Department, SCIENCE NEWS LETTER, 2101 Constitution Ave., Washington, D. C., at least two weeks before change is to become effective.

Copyright, 1936, by Science Service, Inc. Republication of any portion of the SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service.

Publication Office, 1930 Clifton Ave., Baltimore, Md., Editorial and Executive Office, 2101 Constitution Ave., Washington, D. C.

Address all communications to Washington, D. C. Cable address: Scienserve, Washington.

Entered as second class matter October 1, 1926, at the post-office at Baltimore, Md., under the act of March 3, 1879. Established in mimeographed form March 13, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Advertising rates furnished on application.

Member Audit Bureau of Circulations.

Board of Trustees of Science Service

Honorary President, William E. Ritter, University of California. *Honorary Vice-President*, Vernon Kellog, National Research Council. Representing the American Association for the Advancement of Science, J. McKeen, Cattell, *President*, Editor, Science, Garrison, N. Y.; Burton E. Livingston, Johns Hopkins University; Baltimore, Md.; Henry B. Ward, permanent secretary, A.A.A.S. Representing the National Academy of Sciences, W. H. Howell, *Vice-President and Chairman of Executive Committee*, Johns Hopkins University, Baltimore, Md.; R. A. Millikan, Director, Norman Bridge Laboratory of Physics, California Institute of Technology, Pasadena, Calif.; Harlow Shapley, Director, Harvard College Observatory, Cambridge, Mass. Representing National Reseach Council, Ludvig Hektoen, John McCormick Institute for Infectious Diseases, Chicago, Ill.; C. G. Abbot, Secretary, Smithsonian Institution, Washington, D. C.; Harrison E. Howe, Editor of Industrial and Engineering Chemistry, Washington, D. C. Representing Journalistic Profession, John H. Finley, Associate Editor, New York Times; Mark Sullivan, Writer, Washington, D. C.; Marlen E. Pew, Editor of Editor and Publisher, New York City, Representing E. W. Scripps Estate, Harry L. Smithton, Treasurer, Cincinnati, Ohio; Robert P. Scripps, Scipps-Howard Newspapers, West Chester, Ohio; Thomas L. Sidlo, Cleveland, Ohio.

Staff of Science Service

Director, Watson Davis; Staff Writers: Frank Thone, Emily C. Davis, Jane Stafford, Marjorie Van de Water, Robert Potter; Astronomy writer, James Stokley; London correspondent, Donald Caley. Correspondents in principal cities and centers of research. Librarian, Minna Gill; Sales and Advetising Manager, Hallie Jenkins.

DO YOU KNOW?

Eclipses of the sun can occur only "in the dark of the moon."

The Romans raced horses in Britain as early as the third century A. D.

A two-story laboratory is being built of glass blocks at Toledo, Ohio, and is pronounced the world's first all-glass building.

Tests show that there are a number of advantages in training apple trees so that the lowest branches are low, not over 20 inches from the ground.

Comparing the eye to a camera, a specialist points out that the eye can take 12 to 14 pictures each second, sending them on to the brain to be interpreted.

The only woman superintendent in the Indian service is Miss Alida C. Bowler, head of the Carson Indian School and agency of Nevada.

The Fossil Cycad National Monument in South Dakota is distinguished by specimens of fossil cycads which grew a hundred million years ago.

Making false teeth for a whale was achieved at Santa Barbara Natural History Museum, when a whale jaw with 10 or 48 teeth missing was restored for exhibition.

The United States has imported for breeding experiments 22 Red Danish milk cattle, a breed which the Danes have developed to high efficiency as milk producers.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

ASTRONOMY-ENGINEERING

Is drawing energy from the sun a practical plan? p. 23.

BIOLOGY

Can microscopic animals live at temperatures below freezing? p. 30.

BOTANY

Can you always tell poison ivy by the number of leaves? p. 22.

How can the early growth of plants be tested? p. 25.

How much electric potential is there on an onion tip? p. 20.

What is happening to the famed cedars of Lebanon? p. 25.

DENTISTRY

What causes cavities in teeth? p. 22.

ENTOMOLOGY

Does the grasshopper protect his females? p. 30.

How can sound be used against insects? p. 24.

GENERAL SCIENCE

What British scientist has urged a British Science Service? p. 25.

What is the spirit of science? p. 29.

INVENTION

How has the work of the fingerprint expert been aided? p. 27.

LITERATURE

With what is freedom synonymous in Ethiopia? p. 28.

MARINE ZOOLOGY

How does the oyster obtain his oxygen? p. 30.

MEDICINE

How can expectant mothers contribute toward the saving of their own lives? p. 26.

Is painless tooth drilling a possibility? p. 26.

What medical usefulness has the hedgehog? p. 24.

Why are unborn animals valuable as laboratory subjects? p. 26.

PHOTOGRAPHY

What is the greatest altitude from which a photograph of the earth has been made? p. 25.

PHYSICS

How fast can fragments of an exploded detonator cap travel? p. 29.

What evidence is there that the neutrino exists? p. 29.

What new instrument has been demonstrated for "seeing" through haze and smoke? p. 21.

PHYSIOLOGY

How can resistance to colds be measured? p. 22.

PLANT PATHOLOGY

Can dead trees spread Dutch elm disease? p. 30.

How does clover contribute to potato disease? p. 24.

PLANT PHYSIOLOGY

Do trees have cold hearts? p. 24.

How can you make your garden grow to order in the future? p. 19.

PSYCHIATRY

What causes loss of memory? p. 27.

PSYCHOLOGY

Do old people deteriorate mentally? p. 24.

What character traits may keep a prisoner from making good on parole? p. 31.

RADIO

Will broadcast reception improve during 1936? p. 20.

ZOOLOGY

How do fresh bullsnake eggs differ from the hen's? p. 31.

PLANT PHYSIOLOGY

Plant Hormone Research Is Awarded $1,000 by A.A.A.S.

New Substances Added to Water or Mixed With Lanolin and Rubbed on as Salve Will Develop Roots

SOME DAY you will be able to go to the drugstore and buy a salve that will make plant stems grow roots or your window box or garden develop more luxuriantly.

This promises to be the outcome of the plant hormones research by Drs. P. W. Zimmerman and A. E. Hitchcock which was awarded the $1000 prize of the American Association for the Advancement of Science meeting at St. Louis.

Fifteen new substances which cause striking effects when applied to plants were discovered and experimented with during the past year by Drs. Zimmerman and Hitchcock, working in the greenhouses and laboratories of the Boyce Thompson Institute for Plant Research in Yonkers just outside of New York City.

Roots were made to grow on stems, leaves and even parts of flowers of plants by rubbing on or injecting the plant hormones. This is nearly as startling to botanists as the unfulfilled idea of growing hair on a bald head by some substance.

"New roots appear within three to six days wherever the hormone is administered," said Dr. Zimmerman in an exclusive statement to Science Service.

In Water or Oil

"The plant hormones or growth substances can be used as water solutions injected into the stem or added to the soil. One part in a million parts of water is very effective. The hormones can also be mixed with lanolin or oil and used as a salve. In this case it is applied to the aerial parts of the plant. Where the salve touches a stem or leaf, growth is accelerated and then roots arise within a few days. Propagation can be greatly facilitated by applying the substance a few inches back of a growing tip. When roots start the part is removed and planted as a new seedling."

First application of the new prize discoveries will probably be made by nurserymen who will use the hormones to start roots on growing branches which may be cut off and planted as slips.

This is not the first time their researches have been awarded a prize for Drs. Zimmerman and Hitchcock, together with Dr. William Crocker, director of the Boyce Thompson Institute, in 1932 were given the A. Cressy Morrison prize of the New York Academy of Sciences for showing that poisonous gas, carbon monoxide, could initiate and stimulate roots.

Carbon Monoxide

Carbon monoxide was the first pure chemical ever used experimentally to induce roots at unusual places upon plants. Since that time Drs. Zimmerman and Hitchcock have found many other such chemicals. The most effective of these are the following synthetic chemicals made in their laboratory: Naphthalene acetic acid, four indole compounds and phenyl acetic acid. In addition to making these compounds, the scientists extract natural hormones from roots, flowers and ripening fruits.

Growing of what botanists call "adventitious" roots in strange places upon plants is the most spectacular effect of

ROOTS APLENTY

Putting 10 milligrams of indolebutyric acid, chemical controlling root production, into the soil around this tobacco plant, produced this root-covered stem in just a few days.

PRIZE WINNERS

Dr. P. W. Zimmerman (left) and Dr. A. E. Hitchcock (right), who were awarded the A.A.A.S. $1,000 prize for their plant growth research at the Boyce Thompson Institute for Plant Research, Yonkers, N. Y.

ROOTS ON STEM

Tomato plant at right had top cut and a half of one per cent. solution of naphthalene acetic acid was applied to the cut surface. This photograph was taken ten days later. Tomato plant at left is control. Top was cut, no chemical was applied and no roots grew.

the plant hormones but it is also possible to make plants curl their stems and leaves, grow more luxuriantly in predetermined spots and proliferate in an unusual manner.

Science News Letter, January 11, 1936

RADIO

Worse Broadcast Reception Forecast for Next Two Years

WORSE radio reception in the broadcast band region of the radio dials is forecast by Dr. Harlan T. Stetson, Harvard scientist, thanks to the increasing spottedness of the sun that will occur in the next two years.

Because the sun is becoming increasingly active as measured by the great solar storms, seen as sunspots, Dr. Stetson was able to announce this unhappy prediction to astronomers of the American Association for the Advancement of Science.

There is every indication that the sun will reach a peak of maximum spottedness earlier than the usual length of the familiar cycle that astronomers have measured carefully for over a hundred years. Dr. Stetson finds that the next greatest time of sun spottedness will be reached in the early part of 1938, only ten years since the last maximum. Now solar activity is well on towards the half-way mark between the last minimum at the end of 1933 and the next maximum.

Wars, epidemics, weather and all sorts of happenings here on earth have been attributed to sun spots by eager investigators in the past but Dr. Stetson has contented himself with discussing the better authenticated correlations that exist between the sun's spots and radio. Along with the generally impaired conditions for radio will come magnetic disturbances, which may affect telegraphic transmission at times.

Only twice during the past century has the interval between maximum peaks of sunspots been as short as ten years. Large groups of spots have appeared on the sun this month.

Science News Letter, January 11, 1936

BOTANY

Plants Act Like Tiny Electric Batteries

GROWING plants act like electric batteries, developing small electric potentials. These are measurable in only a few score millivolts at most. A millivolt is a thousandth of a volt. Ordinary house current is usually 110 volts; an automobile battery develops six volts.

Various aspects of this electrical activity of living things were discussed at the meeting of the American Association for the Advancement of Science in St. Louis by a number of speakers. Dr. E. J. Lund of the University of Texas told of extremely minute measurements of the electric potentials on individual cells which show that there are differences in voltage even between points only a microscopic distance apart. S. O. Brown, also of the University of Texas, told of measuring the potentials on Chara, a common water-weed. He found, among other othings, that merely touching the tip of the plant will call forth electrical changes in it. Another University of Texas investigator, S. S. Wilks, reported on electrical potentials in the first green shoot that comes from a sprouting oat seed.

If the end of a scarlet runner bean stalk is cut off, and the buds farther down thus induced to start growth into branches, there is a decided decrease in the potential of the joints above such buds, W. S. Rehm of Chicago reported. The potential may even be reversed, from negative to positive. Even a mechanical push against a leaf will cause such an electrical change, at least momentarily.

These bioelectrical potentials can be increased by applying an increase in the pressure of oxygen to which they are exposed, Dr. G. Marsh of the State University of Iowa reported. On onion root tips there is an increase of potential with increase of oxygen pressure, up to about 30 atmospheres, but beyond this point a decrease sets in. Similar results were obtained with a frog's skin, but the critical pressure in this case was 63 atmospheres.

Science News Letter, January 11, 1936

Haste is the chief cause of automobile accidents, according to an official of an accident insurance company.

Termites have found their way to St. Helena, and have damaged the wood in Napoleon's residence there.

PHYSICS

New Infra-red "Eye" Pierces Through Haze and Smoke

Combined With Telescope or Microscope, This New Device Will Find Many Scientifc and Other Uses

THE NEW super-penetrating eye of science that pierces palls of haze and smoke, which was demonstrated before the American Association for the Advancement of Science, by Dr. V. K. Zworykin of the Radio Corporation of America, will have its first use in the confines of a biological laboratory, searching out new facts about life processes.

Important military and navigational applications of this new eye of science are, however, causing excited comment among the scientists. The new device, which looks like a telescope from the outside, does its seeing by the infra-red rays that the unaided eye cannot see.

The heart of the new infra-red "eye" is a thin film of caesiated oxidized silver, deposited on a metal plate. This substance is specially sensitive to infra-red light, from the lower limit of visibility, at about 8,000 Angstrom units, down to about 10,000 Angstrom units.

When the infra-red image of some object, either giving off infra-red rays itself or reflecting them from an infra-red searchlight, is focused on this special film, it gives off a stream of electrons from all the lighted parts of the image. These shoot up a tube, passing through a series of electrically charged rings, which bends them as a lens bends light. This part of the apparatus Dr. Zworykin calls an "electron lens."

The focused stream of electrons, now arranged in image form again though still invisible, strikes on a second screen, this one covered with a fluoresent substance, working on the same principle as the ordinary fluoroscopes used in hospital X-ray rooms. This turns the invisible electron image into a visible light image, very clear and distinct. The process is thus summed up in three steps: first, the infra-red rays from the object itself; then, the translation into electrons; finally the second translation of electrons into an image in visible light.

The uses of the new infra-red "eye," in both peace and war, are manifold, though the usefulness of the device is limited to conditions under which infra-red rays will travel through the atmosphere. Infra-red will easily penetrate haze and smoke, but fog stops it because the water-particles in fog are too big to let the rays pass. They might get through very thin fog, but the real fog menaces to air and sea navigation are still baffling, Dr. Zworykin and his aides said.

Wartime uses that suggest themselves are obvious. Warship funnels and airplane engines emit infra-red rays, so even at night they can be detected. It would do them no good to screen themselves in chemical smoke, for infra-red rays pass through that easily. All that gunner, torpedo-man or bombing pilot would need do would be to aim at that spot of infra-red that betrayed hot exhaust gases. A different wartime use could be in signaling. Enemy watchers could not see an infra-red flashlamp unless they had an infra-red telescope and knew exactly where to point it.

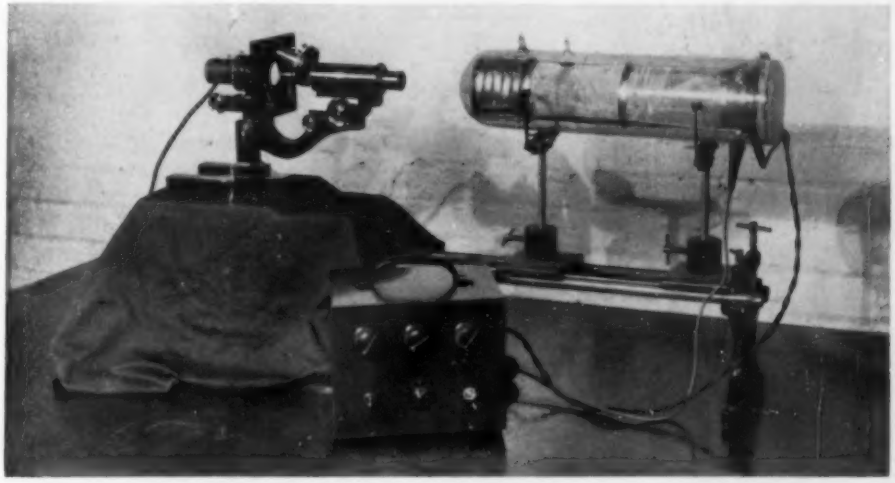
More peaceful uses range from aviation and astronomy to zoology. A series of infra-red beacons could be used as landing lights when haze obscures the ground, or the buildings or other landmarks of the airport could be floodlighted with infra-red.

Astronomers can study changes on the sun's rim during an eclipse, through haze or smoke or thin clouds that hitherto have defeated them. The device may also be used on stars and nebulae, since these also radiate infra-red.

A highly practical use that has been suggested is the detection of forest fires. Often during forest fire season in the west, the air is so thick with smoke and haze that the lookouts on their towers have a hard time telling where the fire really is. With an infra-red telescope they could sweep their horizon and actually see the flames through the smoke.

A more strictly scientific use is the one in which the device will first find employment. Many microscopic details of plants and animals are invisible under ordinary light, but show up under infra-red. Infra-red microscopes will therefore be very useful. Furthermore, many of the smaller animals are either kill by visible light or so repelled by it that they persistently flee from the microscope's field. With the new device adapted to microscopic viewing, these light-shy creatures can be studied without their knowing it.

A combined electric eye and amplifier that promises to speed television was also demonstrated by Dr. Zworykin. This device not only converts light into electricity like conventional photoelectric cells but steps up the current mil-



TO SEE DARK "LIGHT"

Dr. V. K. Zworykin's electronic image tube as used with an infra-red microscope. This same tube may be used with a telescope.

lions of times, all within a single tube.

Immediate practical applications to electrical gadgets, to television and to facsimile transmission of messages and pictures are foreseen.

The new electron multiplier works equally well with direct current or alternating current of any frequency. It utilizes what electricians refer to as "secondary emission." A stream of electrical particles is generated by light hitting a metal plate and then this electricity releases other electrons from a series of plates in ever increasing volume, all within one tube.

In one demonstration a phonograph recording was converted into fluctuating light which was picked up by the new electron amplifier some distance away in order to operate a loud speaker directly without intervening tubes.

Science News Letter, January 11, 1936

PHYSIOLOGY

Capacity for Work Measures Body's Resistance to Colds

A MEASURING stick for resistance to cold and possibly pneumonia seems to have been found in the capacity of the body to work. Experiments indicating this were reported by Dr. Arthur Locke of the Western Pennsylvania Hospital Institute of Pathology, Pittsburgh, to the Society of American Bacteriologists.

This does not mean that hard workers are necessarily the most resistant to colds and pneumonia, Dr. Locke explained. It is the body's ability to do work, rather than the person's inclination to work, that is important. Dr. Locke sees resistance or defense against invading disease "germs" as an activity that involves work. "Every phase of the activity which is necessary for the support of life requires an eventual expenditure of work," he said.

Rabbits able to perform quickly the simple task of warming up after chilling are also able quickly to get invading pneumonia germs out of their blood, he found.

This warming-up time is a good index of the rabbit's resistance, but it is not a practical measure of man's resistance. Instead, Dr. Locke uses for man the amount of oxygen consumed in a minute while the man is riding a bicycle as hard as he can.

The work on men has only just begun. Already, however, Dr. Locke found that persons who use about two quarts of oxygen—2,000 CC—in a minute during hard work have fewer and less severe colds than those who use less than this amount of oxygen. Because he has been able to study only 39 people during two months, Dr. Locke hesitates to draw any definite conclusions. The studies with humans will be continued during the winter.

Here, it appears, is pioneer work that may make it possible in future for patients to have a simple test of their resistance to cold and pneumonia made in the doctor's office.

What to do in cases that show a low measure of resistance is the next point to be studied. Work with rabbits suggests that the solution of this part of the problem may be concerned with diet.

Science News Letter, January 11, 1936

DENTISTRY

Cavities in Teeth Due To Number of Causes

CAVITIES in teeth, most frequent cause of dental woes, are not due to a single cause but to a whole complex of causes. It is worse than useless to over-simplify ideas of causes and prevention of decaying teeth, as is often done in toothpaste advertising, and in "health week" slogans as well.

This appears to be the consensus of opinion of a group of dental scientists who held a discussion of dental troubles and what can be done about them, during the sessions of the American Association for the Advancement of Science.

Dr. Charles F. Bodecker of the Columbia University dental school classified cavity causes into three groups: systemic predisposing factors such as dietary unbalance and hereditary defects, local predisposing factors such as an improper chemical state of the saliva, and the immediately exciting factors which are food retention and bacteria. The latter actually make the holes in the teeth, but can do so only if the other two factor groups have first been active.

A strong suspicion that the old-fashioned warning against too much candy really has a pretty close connection with tooth decay in children was put forth by Dr. Philip Jay of the University of Michigan dental school. Several groups of children on uniform controlled diets with little sugar, but with little else in common, had relatively little trouble with their teeth. This was especially marked in a group of diabetic children, who of course had to be kept on a minimum of sugar. On the other hand, children with free access to candy did have a good deal of tooth decay to contend with. Lactic-acid forming bacteria appear to be especially active in the presence of sugar, as enemies of tooth enamel.

The bacteria active in sore and bleeding gums are not at all the same as those connected with the decay of the teeth themselves. Dr. Theodore B. Beust of the University of Louisville school of dentistry reported a study of these troubles, in which the predominating microorganisms were bacteria of the "corkscrew" type, including spirochetes and spirilla, rather than the familiar rod-shaped bacteria of dental caries.

Glands, responsible for our bodily destiny in a thousand other ways, have their say about the development of our jaws and teeth, too, Dr. Isaac Schour of the University of Illinois school of dentistry pointed out. The principal glands whose activities in dental development have been most directly traced include thyroid, parathyroid, adrenals and the sex glands.

Science News Letter, January 11, 1936

BOTANY

Poison Ivy Can Have Five Leaves Too

POISON ivy, nobody's friend, occasionally tries to escape the stigma imposed by the old ready-recognition rhyme, "leaflets three, let it be," by growing five leaves instead. But without success, Fred A. Barkley of Washington University pointed out before the meeting of the Phi Sigma Biological Society.

Mr. Barkley, during examinations of many pressed specimens of poison ivy at the Missouri botanic gardens, found a number of these abnormal five-leaved poison ivy plants. Specimens grown from poison ivy seed also turned up five-leaved once in a while. But the five-leaved arrangement was unlike that of the innocent Virginia creeper or woodbine, so the deception did not work.

Science News Letter, January 11, 1936

ASTRONOMY-ENGINEERING

Solar Energy Now Caught With 15 Per Cent. Efficiency

Dr. C. G. Abbot Increases Sun Power Machine Efficiency To About Half That of Coal-Steam Plant

PRACTICAL utilization of the sun's rays to do the work of the world is forecast by a sun power machine exhibited by Dr. C. G. Abbot, secretary of the Smithsonian Institution, Washington, D. C., before the American Association for the Advancement of Science.

Within the last few months Dr. Abbot has greatly increased the efficiency of his sun power plant until now experiments indicate that fifteen per cent. of the solar energy falling on the ray-gathering mirrors may be converted through a steam engine into mechanical work. Since double that efficiency or 30 per cent. is considered good accomplishment for a conventional coal fired steam power plant, Dr. Abbot's arrangement of mirrors promises to attract the practical attention of power engineers in the near future.

The fuel of the sun power plant is free whenever and wherever the sun shines. It is not necessary to mine and transport coal, take oil from the ground or chop down fire wood. Sun power has the possibility of making waste deserts with their sunshine sources of power.

There is presented the spectacle of great batteries of mirrors covering waste land providing energy convertible into electricity for transmission to centers of population.

Not Expensive

Dr. Abbot's new solar power plant is simple and inexpensive to build. He uses parabolic aluminum alloy mirrors which stay bright and untarnished. These focus the rays upon a dark opaque liquid that absorbs the heat and is thus raised to a temperature of 350 degrees. This sun-fired boiler could provide steam to run an engine that could generate electricity. No expensive and unusual constructions are needed in Dr. Abbot's device and no costly mechanical movements are needed to follow the sun, which were a feature of earlier and less efficient sun power plants.

Reports from Russia, Dr. Abbot said, indicate that an attempt to utilize solar heat practically is being made by Soviet engineers. Twenty to thirty years ago sun power plants were attempted in California, Arizona and Egypt but they were far less efficient. Dr. Abbot has made earlier experiments with solar heat, particularly for cooking purposes.

The fact that power can not be generated at night or when clouds cut off the sun's rays will prevent the sun plant from producing power continuously. Dr. Abbot suggests that in sunny hours surplus power could be stored in giant storage batteries or by pumping water into a reservoir.

If the solar power plants were to be installed over an area equal to that flooded by Boulder Dam Lake, the total capacity would be about 5,000,000 horsepower, Dr. Abbot estimated. It takes about six of the units for each horsepower, and about 72 square feet area would be required for the six units. At present, these units can be built for about ten dollars apiece, but with mass production methods, the cost could be reduced materially. Each one consists of simple machine-built parts that could be economically produced in large quantities.

Science News Letter, January 11, 1936

Canadian scientists are testing the relative value of durum wheat varieties for the macaroni industry.

RADIO

January 14, 4:30 p. m., E.S.T.
MYSTERIES OF RADIO FADING—Dr. J. H. Dellinger, Chief of the Radio Division, National Bureau of Standards.

January 21, 4:30 p. m., E.S.T.
REMEMBERING WHILE YOU SLEEP —Dr. Harry M. Johnson, American University.

In the Science Service series of radio discussions led by Watson Davis Director, over the Columbia Broadcasting System.

SOLAR POWER PLANT

Dr. C. G. Abbot demonstrates his device for catching the sun's energy to scientists at the meeting of the American Association for the Advancement of Science.

PSYCHOLOGY

No Real Decline of Mental Power With Increasing Age

"AN unfortunate libel" was the term Dr. Irving Lorge, of Teachers College, Columbia University, applied to the popular idea that aged persons decline in mental ability with advancing years.

Speaking before the meeting of the American Association for the Advancement of Science, Dr. Lorge said that the deterioration observed by psychologists and laymen is more apparent than real. It is due to a combination of dimming sight, slowing movements, dulled hearing, and a preoccupation with life's problems cumulatively. It is not a loss of mental power as such, but rather an inability to work as fast with mental tasks, Dr. Lorge said.

Tests given to 143 unemployed adults aged from 20 to 70 years indicated that the apparent decline with age differs when different mental tests are used as the measuring stick, those tests involving speed showing the greatest decline.

Science News Letter, January 11, 1936

PLANT PHYSIOLOGY

Trees Cool At Heart During Hottest Weather

TREES are cool in their hearts, even in the hottest weather, Prof. E. S. Reynolds of Washington University, St. Louis, told the American Society of Plant Physiologists.

For several years, Prof. Reynolds has kept an electric thermometer buried in the heart of a cottonwood tree. A second instrument was embedded just where bark and wood come together.

During the great heat of the summer of 1934, when the air temperature was about 110 degrees Fahrenheit, the temperature at the tree's center was only about 60. Whenever, under these conditions, there was a change in the air temperature there was an immediate change in the tree-center temperature, but in the opposite direction.

Temperatures at the junction of wood and bark were warmer than those at the tree-center, but cooler than air temperatures by from 15 to 18 degrees Fahrenheit. This junction temperature tended to rise with that of the air in the early morning, but soon dropped or at least became constant as the tree-center temperature grew lower.

Prof. Reynolds explained this thermostatic phenomenon on the theory that the rapid evaporation of water from the leaves put a heavy strain on the water inside, thus causing a rapid internal evaporation also. Since temperatures drop during evaporation, the inner tissues of the tree would thus be cooled.

This explanation also gives support to the theory of ascent of sap in trees now most widely accepted by botanists. According to this theory, water is literally pulled up through the slender wood-tubes of the tree as though it were in the form of microscopic wires. Water in such slender columns is no longer "as weak as water," but has a considerable tensile strength.

Science News Letter, January 11, 1936

MEDICINE

Hedgehogs Used in War Against Common Cold

NEWEST recruit to the army of animals helping in the fight against diseases in the hedgehog This prickly animal is pinch-hitting for men and chimpanzees in the campaign against the common cold, just as ferrets were enlisted by scientists in experiments which led to isolation of the influenza virus.

Dr. J. T. Edwards, of the Cattle Testing Station at Pirbright, Surrey, has reported to the Royal Society of Medicine that a number of hedgehogs showed an increase of nasal discharge after being inoculated with secretions from human cases of acute "cold in the head." (The *Lancet*, Dec. 7)

The effect is due, Dr. Edwards seems to consider, to a common-cold virus preparing a way for bacteria, already present within the hedgehogs' nostrils, to multiply and create catarrh. This scientist argues by analogy from his experiments on hedgehogs with the virus of foot-and-mouth disease; he has found that the virus of that disease activates the normal nasal bacteria of the hedgehogs, frequently causing death from broncho-pneumonia or septicemia.

Dr. C. H. Stuart-Harris also reported to the meeting that at the National Institute for Medical Research, London, he has carried out similar experiments, in consultation with Dr. Edwards. He confirms the increased nasal discharge from hedgehogs inoculated with common-cold secretions. But as yet he hesitates to conclude that the effect can be depended on—in other words, that the hedgehog is necessarily a useful animal for common cold experiments. One reason for his doubt is that hedgehogs vary widely in the amount of their nasal secretions.

Science News Letter, January 11, 1936

IN SCIEN

PLANT PATHOLOGY

Insect Pest of Clover Carries Potato Disease

CLOVER, one of the most useful of the farmer s crops, may under certain conditions be an unintended ally of a very troublesome potato disease, known as yellow dwarf. At the meeting of the American Association for the Advancement of Science, L. M. Black, plant pathologist of Cornell University, told how.

The virus of the disease is carried by a small insect, the clover leafhopper. This pest prefers to feed on clover, but at need will turn to other plants, including potatoes. Clover is not susceptible to the yellow dwarf disease, though it may harbor it without suffering from it, after the fashion of a human "carrier" of typhoid or diphtheria.

Science News Letter, January 11, 1936

ENTOMOLOGY

Sounds May Be Used To Combat Insects

LURING insect enemies to their doom by imitating their mating calls, as hunters now lure deer and moose, was suggested as a new bit of tactics in the endless war between man and the six-legged hordes that endlessly threaten all his works. The immediate enemy concerned is the seventeen-year cicada, but the technique might be used against other singing insects as well.

The suggestion was made by J. A. Hyslop of the bureau of entomology and plant quarantine, U. S. Department of Agriculture, speaking before the American Association of Economic Entomologists. Mr. Hyslop, who regards the seventeen-year cicadas—usually miscalled "locusts"—as a real insect pest, suggested that when the males start singing, presumably to attract the females, it might be possible to frustrate these insect romances and thereby abate their biological consequences, by setting up counter-attractions in the form of other luring sounds, produced by suitable electric mechanisms.

Science News Letter, January 11, 1936

...NE FIELDS

BOTANY

Famed Cedars of Lebanon Now Near Extinction

CEDARS of Lebanon, those famous, mighty trees that Solomon bought from King Hiram of Tyre to be the roof-timbers of his magnificent temple, are now almost a lost tribe. Once they dominated the whole of the Lebanon mountain pass, but now there are only five rather small groves of them, Dr. Robert M. Warner of Iowa State College informed a botanical audience at the meeting of the American Association for the Advancement of Science.

The surviving groups are found at about 6,000 feet altitude on the western slope of Lebanon. They range from north to south over about fifty miles. The oldest grove is a compact clump of trees covering about fifteen acres, but the others are younger and more nearly open stands.

Science News Letter, January 11, 1936

PSYCHOLOGY

Brain Waves Give First Evidence of Brain Centers

ELECTRIC messages obtained directly from a human brain by means of an electrode inserted in the brain tissue have given scientists the first real direct evidence of a very strict division of labor in that important organ directing thought and action. The experiment was performed by Dr. Edmund Jacobson, of the University of Chicago, and was reported to the American Association for the Advancement of Science.

The muscles used in shutting the jaw are controlled in the brain center thus explored by Dr. Jacobson. This was indicated by the creation of the "brain waves" in that area when the subject closed his jaw. No other type of movement caused waves from this area, he found, although the subject moved his tongue, pursed his lips, frowned, clenched his fists, and moved shoulders and neck.

Even opening the jaws seems to have its control in a separate area, for this action caused no waves in the jaw-closing area. Neither did mental acts of remembering or doing mental arithmetic.

Dr. Jacobson has been waiting for years for a subject on whom such an experiment could be made, he told the scientists. Animals are not suitable because of the difficulty of training them to just the movements desired and no other at the same time.

The human subject finally obtained was a man who had lost a part of his skull in a previous operation on his brain to remove a tumor. Because of this the experiment was comparatively simple and entirely painless, for the brain itself is not capable of feeling pain.

Science News Letter, January 11, 1936

GENERAL SCIENCE

Link Between Science and Public Urged in England

THAT there is need for "some method of closing the gap between the mind and outlook of the publicist and those of the trained scientist" was urged by Sir Frederick Hopkins, Nobel prize-winner for his pioneer researches on vitamins, in his valedictory address as president of the famous Royal Society of London.

"It is a just claim that in a civilization so largely based on science as that of today, the scientist should have more influence on policy than he has hitherto been allowed," Sir Frederick Hopkins said.

"Not long ago the gap in question was wide; it is now, I think, lessening. Occasionally at least, modern statesmen do seek scientific guidance, and, I think, know better than they did how rightly to obtain it. But it is time, perhaps, that the building of a bridge should begin on the scientific side of the gap. This is a task for organized scientific effort and the pooling of knowledge. As John Stuart Mill urged, knowledge before it can assist public action must somewhere be concentrated."

Sir Frederick Hopkins is a keen supporter for the movement for the establishment in Britain of a scientific news service similar to Science Service in America. He believes that the development of close contact between the scientific world and the general public is a social responsibility which falls, partly, on scientists themselves.

The new president of the Royal Society is Sir William Bragg, world-renowned physicist, who is director of the Royal Institution of Great Britain and of the associated Davy-Faraday Research Laboratory.

Science News Letter, January 11, 1936

BOTANY

Glass and Paper Setup Tests Growth of Plants

EARLY stages in plant growth are studied very conveniently in a simple apparatus made of glass and absorbent paper, by Prof. M. A. Raines of Howard University. At the meeting of the American Association for the Advancement of Science, Prof. Raines showed how it works.

A flat piece of glass is set up, inclined at an angle of about 15 degrees from the vertical. Against it is laid a piece of absorbent paper, its upper edge turned back and dipped into a pan of water. This turned-back edge serves as a kind of wick, keeping the whole sheet moist.

A germinated seed is set between the glass and the paper, near the top. The little plant proceeds to grow just as though it were in the soil. The root system develops nicely flattened out, so that all details of its growth can be observed and measured.

At the end of the growth period, the paper sheet can be lifted away from the glass, with the whole plant system clinging to it, and pressed for storage and future reference.

Thus far most of the cultures have been made with absorbent black paper, Prof. Raines said, but successful cultures have also been made upon sheets of asbestos, and promising experiments have been conducted with sheets of compressed glass wool.

Science News Letter, January 11, 1936

PHOTOGRAPHY

Photograph Shows Area Larger Than Many States

PHOTOGRAPHS proving the earth is round, which Capts. Albert W. Stevens and Orvil A. Anderson exhibited on the occasion of the award to them of the National Geographic Society's Hubbard Gold Medal, show as much of the earth's surface as the combined area of Connecticut, Maryland, Delaware, Massachusetts, New Hampshire and New Jersey.

Taken from the record height of 72,395 feet the pictures show the horizon 330 miles away and 244 miles of it. Total land area in the picture is 40,000 square miles.

Capt. Stevens five years ago took the only other picture showing the curvature of the earth when he went up 21,000 feet over South America.

Science News Letter, January 11, 1936

MEDICINE

"Blood Banks" May Receive Deposits for Transfusions

Expectant Mothers May Prepare for Emergencies By Donating in Advance Blood to be Used if Needed

A "BLOOD bank," into which expectant mothers may deposit as much as a quart of their own blood shortly before the crucial time of confinement, and which may be drawn upon for life-giving strength during childbirth, now offers hope of further reductions in maternity death rates.

One of several results of experiments with preserved or "canned" blood for transfusions, the blood bank method of aiding childbirth was announced by Dr. Maurice Vischer, head of the physiology department at the University of Illinois research hospital in Chicago.

"Taken from the patient during the last stages of pregnancy when she has stored up a healthy surplus of rich blood, the reserve blood is preserved by electric refrigeration for possible use at any time before, during or after childbirth," Dr. Vischer said.

Red corpuscles in the blood will live as long as a month outside the body if properly preserved and refrigerated, the young physiologist explained.

"The principal advantage of the banked blood method, obviously is one of speed in supplying immediate transfusions without the sometimes fatal delay of searching for a professional or other donor of suitable type. Because the blood is taken from the patient at least a week before birth is due, there is ample time for the body to furnish new blood, thereby alleviating danger of weakness," Dr. Vischer pointed out.

Canned Blood

Other successful experimentation with preserved blood, announced by Dr. David John Davis, dean of the university's medical college, consists of removing the blood from the lifeless bodies of accident victims and "canning" it in the same manner as that employed in the blood bank.

To avoid infection, blood for this purpose is taken only from the bodies of persons who have died suddenly and upon which autopsies may be performed. Before being preserved the blood is classified as to type so as to be readily accessible for emergency transfusions, Dean Davis said.

Not the least advantage of preserved blood, he added, is elimination of the high cost of blood furnished by professional donors—from fifteen to fifty dollars and up for each transfusion.

Hundreds of lives already have been saved in Russia by this medical innovation, Dean Davis reported on his return from Moscow where he studied the system under its originator, Dr. S. S. Judin, chief surgeon at the Sklifassowsky Institute there.

Dr. Vischer predicted that Chicago may soon have the first "blood clinic" to be established in America. Accident cases involving profuse bleeding would then be rushed to this one hospital for transfusions and preliminary treatment.

Science News Letter, January 11, 1936

MEDICINE

Take New Step Toward "Painless Dentistry"

A NEW step toward "painless dentistry" seems to have been taken by a Columbia University professor. The latest development is the discovery of Dr. L. L. Hartman of a "desensitizer" that does away with the painful sensations during the necessary drilling before a cavity in a tooth can be filled.

The desensitizer, which Dr. Hartman discovered after nearly twenty years of research, is a colorless fluid. Unlike other anesthetics, which must be injected into the nerves or pulp of the teeth, Dr. Hartmen's fluid is applied to the dentin, the substance which forms the bulk of the hard part of the teeth. It takes a minute or a minute and a half to take effect and the pain-killing effect lasts from twenty minutes to an hour, giving plenty of time to prepare almost any cavity for filling, Dr. Hartman explained. There are no unpleasant after effects and the pulp of the tooth remains normal.

The chemical composition of the desensitizer has not been announced and the fluid is still nameless. Patent rights for it have been assigned by Dr. Hartman to Columbia University. It will be on the market soon, and the quality and price will be controlled by the University in order to make it available for general use and to prevent exploitation of the public.

Human patients had to serve as "guinea pigs" in the experiments leading to perfection of the desensitizer, since there is no satisfactory way of testing a pain-killer on a laboratory animal.

Discovery of this new kind of anesthetic for use in dental work recalls the fact that dentistry gave anesthetics to the world. Ether anesthesia was first used in the extraction of a tooth before its famous trial for a surgical operation at the Massachusetts General Hospital, Boston, in 1846. William Thomas Green Morton, who gave ether its first public demonstration as a surgical anesthetic, had been a dentist before he studied medicine.

Science News Letter, January 11, 1936

MEDICINE

Unborn Animals New Allies In Fight On Disease

UNBORN baby animals are the latest allies of medical investigators in studying virus diseases such as infantile paralysis and smallpox.

This new approach was reported to the Society of American Bacteriologists by Dr. Oram C. Woolpart of Ohio State University and associates I. S. Neiman, Joseph Stritar, N. Paul Hudson and Floyd S. Markham of Ohio State University and the University of Chicago.

Unborn guinea pigs, these investigators found, can be infected with the "germs"—virus or bacillus—of smallpox, tuberculosis, diphtheria and submaxillary gland disease. The animals were more susceptible to these diseases before birth than after, it was also found. Infantile paralysis virus, however, did not produce the disease in the unborn animals.

The studies are important because they show that in the fetus or unborn animal scientists have a good "control" for their studies of disease germs. Ordinarily unborn animals are free from disease germs, becoming infected at birth or soon after. When a scientist needs to produce a disease in an animal to study it and learn how to protect humans from it, he needs disease-free animals to serve as controls for comparison. The fetus now seems to be the solution of this problem.

Science News Letter, January 11, 1936

CRIMINOLOGY-INVENTION

Eye-of-All-Work Machine Aids Pasadena Police

CATCHING criminals has become so active that mass production methods are being employed by the Pasadena Police Department. Newest aid is a machine for easily examining fingerprints and known as a dactyloscope.

The new fingerprint machine projects the image of a fingerprint so that it can be viewed in normal posture and with both eyes at once. Moreover, several observers can see the image at the same time.

The projection screen is not at a distance as in motion pictures but only about two feet from the eye. This arrangement permits a tracing to be made of the enlarged fingerprint in a few seconds which may be compared with a latent print taken at the scene of the crime or with suspected prints in the extensive fingerprint files.

The new apparatus has also been found useful for the study and measurement of written and typed material and, in fact, is used as an eye-of-all-work at Pasadena Police Headquarters.

Science News Letter, January 11, 1936

NO MORE SQUINTING

Replacing the detective's trusty magnifying glass, this machine makes it far easier to examine finger prints.

PSYCHIATRY

Lost Memory Restored By Hypnosis Treatment

A SNOWY sidewalk . . . a fall with a hard blow on the back of the head . . . a memory lost to new impression . . . three years during which the injured man would forget any new happening as soon as it occurred. Then treatment with hypnotism and a restoration to normal except that those three years remained always blank.

This was the dramatic story told to the meeting of the American Association for the Advancement of Science by Dr. Hans Syz, of New York City.

The case was of great interest to scientists, not only because it was an unusual type of lost memory, but also because it demonstrated that this sort of injury to the mind from a physical cause may respond to a mental treatment.

Originally the injury was a physical one to the brain. The loss of memory of recent events was accompanied by headache, dizziness, and partial paralysis.

The patient, who had been an efficient foreman in a silk mill, healthy, popular, and intelligent, after the accident was unable to carry on a conversation because he could not remember what the talk was about. If he left his room in the hospital, he had to carry with him a note so that he could find his way back. When his daughter visited him, he would greet her affectionately and ask her whether she had heard of the accident, but if she left the room for an instant, he would greet her again the same way on her return. This state of affairs lasted for three years.

He did not forget his name or "lose his personality," as is more common in such cases. Up to the moment of his fall, everything was known to him. Everything that happened after that was lost.

"I think I am in a hospital," he would say. "But I believe there is something wrong. . . I saw my wife the last time—if I am to say it as I feel it—yesterday, Friday, the day before the accident. But when I think it over, I realize that something must have happened in between. It is not winter any more and my wife must have been told something of the accident."

When he was hypnotized, it was found that he could remember to do things five or ten minutes after he was told to do them. That was a hopeful sign. Then it was found that under hypnosis he could remember some of the things that occurred during his waking state.

An increasing number of facts were given in this way so that he gradually became acquainted again with his immediate environment.

During the treatment, the patient remembered and revealed the mental problems that had worried him at the time of the accident. He also remembered a conversation that he heard during his illness that made him think that his wife was unfaithful to him. These problems accounted for the fact that he failed to recover from his loss of memory after he had physically recovered from the blow on the head, Dr. Syz believes.

Science News Letter, January 11, 1936

LITERATURE

Ethiopian Bible Odd and Colorful, Scholars Are Told

THE Bible of Ethiopia's Christian warriors, believed to date in translation from fourth or fifth century A.D., is written in colorful and sometimes expurgated language.

So the Society of Biblical Literature and Exegesis was told by Prof. Moses Bailey of Hartford Theological Seminary.

Citing oddities of the Ethiopian Bible, Prof. Moses said:

"The Garden of Eden, or Garden of Voluptuousness, as it is called in Greek as well as Hebrew, is nicely expurgated as the "Garden of Pleasantness."

In the creation story, where Hebrew and Greek versions state that God made a firmament or dome over the earth, the Ethiopian translator said God made a roof. Presumably this would mean a thatch roof, the common kind of the country, Prof. Bailey explained.

Prof. Bailey is teaching one student the Ethiopian language at the Hartford Seminary, and thus Columbia University is not the only institution offering a course in Ethiopian, as has been stated.

Nomadic wanderings of Bible patriarchs and tribes are translated in Ethiopian by a word meaning either to journey or to be free. Wandering and freedom are one and the same, to the Ethiopian, Prof. Bailey explained. A common name for Ethiopia itself is the Land of Freedom, Bher Ge'ez, and the classical speech is the Language of Freedom.

Once, in the Ethiopian Bible, the word for freedom is used of insanity to describe David's feigning madness. To the Ethiopian it was a sort of mental wandering.

"Just as a French Bible is quite another book from an English Bible, so the Ethiopic presents its own picturesque world, even though it is a fairly literal translation of the familiar Greek," Prof. Bailey said.

The Ethiopic version is important to Bible scholars because it was translated early from the Greek, and helps to show what the early Greek text was like.

Science News Letter, January 11, 1936

ARCHAEOLOGY

Art Reveals Ancient Jews Used "Visual Education"

FROM documents coming to light, and from paintings and mosaic floors unearthed in ruined synagogues, ancient Jews are revealed in a new light as artists.

"The Jews are credited with establishment of the Public School System, introduced by the High Priest Joshua ben Gamala in 64 A.D.," said Dr. Paul Romanoff of the Jewish Theological Seminary of America.

"The art in the synagogues, the murals and mosaics, will now credit the Jews with the introduction of one of the modern methods in education—visual instruction."

Dr. Romanoff addressed scholars attending the meeting of the Society of Biblical Literature and Exegesis.

The religious pictures, he finds reason to believe, were used to illustrate subjects studied in schools in the synagogues or in adjacent buildings.

"The universal belief that Jewish Biblical and Rabbinic law prohibits the cultivation of art is erroneous and unfounded," declared Dr. Romanoff. "Art in ancient times having been a medium of pagan worship, the Jewish religion naturally evinced an aversion to it. It can be definitely established that in the third century of our era murals and mosaics with human figures were legally permitted in Palestine by the outstanding Rabbis and heads of Jewish Academies."

The date when murals and mosaics were legally permitted can be fixed, he said, by a recently discovered fragment of the Palestinian Talmud published by Prof. Epstein of the Hebrew University of Jerusalem. Jews were allowed to portray human figures on synagogue walls in Palestine in the middle of the third century. Mosaics were permitted at the end of the third century. In private houses such adornments had been in use for some time before that. And in Babylon, Jewish artists had begun to paint Old Testament scenes on synagogue walls near the end of the second century. Ruins of a synagogue in Dura on the Euphrates have revealed some of these well preserved Bible scenes painted 244 A.D.

References in ancient writings indicate that Jews were permitted to own sculptural art as early as the second century.

"Statues worshipped by pagans could be used by deforming them a little, such as the breaking off of a finger tip or the tip of an ear," said Dr. Romanoff.

Jewish sculptors in Palestine even engaged in modelling figures of pagan deities, he added.

Science News Letter, January 11, 1936

PHYSICS

Detonator Caps Develop Enormous Energies

EXPLOSIONS of the detonator caps used to set off dynamite blasts develop unbelievable energies and do very strange things, Dr. R. W. Wood, professor of physics at the Johns Hopkins University, told fellow-researchers at the meeting of the American Association for the Advancement of Science. In experiments which he described, tiny pellets of copper no bigger than the head of a pin were driven through a couple of telephone directories, and one of them, fired downward into a crock of water, shattered it into a dozen pieces.

Prof. Wood was interested in the investigation of these violent explosives through the tragic death of a prominent Baltimorean's wife. She opened a furnace door to inspect the fire, when a blasting cap, accidentally left in the coal by a miner, exploded. It drove a pinhead-sized pellet of copper through her breastbone, severing a large artery and causing her death in a couple of minutes.

The tiny fatal missile, when recovered at the autopsy, had a peculiar shape. It was pear-shaped, with a flange or skirt of thin copper extending around it. Prof. Wood's subsequent experiments showed that this curious shape was caused partly by the deformation of the end of the cap's copper shell, partly

by the almost instantaneous melting of the copper and its rolling up into the rounded end of the pear-shaped bit.

Prof. Wood fired many such detonators, loaded with two different fulminant compounds, and studied their effects. Spark photographs of the air-trails they left in their courses indicated that these end-pellets zip through the air with a velocity of six thousand feet a second, approximately three times the speed of a rifle bullet. The thin sides of the cap are torn into thousands of almost microscopic fragments, each able to make a tiny nick in a piece of plate glass. A flake of one of the explosive compounds, laid on a glass plate and touched off with a hot wire, shattered the glass in fragments.

While not every accidental explosion of a fulminating cap ends as tragically as the one that "set off" Prof. Wood's research, there are plenty of them every year that result in lost fingers and blinded eyes. Children playing around quarries and similar places find them, pound them with a rock or a hammer "for fun," and are permanently injured.

Science News Letter, January 11, 1936

PHYSICS

Evidence For Existence Of Neutrino Presented

EXPERIMENTAL evidence for the existence of the "neutrino"—postulated but never-found new atomic particle—was presented by Dr. Kenneth T. Bainbridge of Harvard University to the American Physical Society.

For years scientists have known that the cores, or nuclei, of atoms contained the electrons, the negatively charged particles of small mass, and the protons which are positively charged particles of the same mass as the hydrogen.

In 1932 Prof. James Chadwick of Cavendish Laboratory, England, discovered that atom nuclei also contained the neutron which, as the name suggests, is neutrally charged in the electrical sense. Prof. Chadwick won the 1935 Nobel Prize in physics for this discovery.

More recently a number of theoretical scientists have postulated the existence of the neutrino, or little neutron, in order to explain certain products produced in artificial radioactive transmutation of the elements.

Working from known facts and with known theories it can be shown, for example, that certain isotopes can exist only if the neutrino is a fact instead of a mathematical abstraction. The search for such isotopes would, then, constitute a test for the existence of the neutrino.

Dr. Bainbridge's report concerned the discovery of what might be called the "neutrino" isotopes. Using his new mass spectrograph — which might be likened to a super scale for weighing individual atoms—the Harvard scientist detected isotopes of cadmium and indium of atomic weight 113, indium and tin of atomic weight 115 and antimony and tellurium of atomic weight 123. These isotopes can exist only if the neutrino exists.

The experimental technique is an indirect one, naturally. It is about like saying that all living bodies must contain hearts and if you can find a living body you have evidence for a heart inside it, even though you may not be able to see the heart itself.

Science News Letter, January 11, 1936

PLANT PATHOLOGY

Artificial Wind of Fans To Banish Turf Disease

FANS built like airplane propellers were used to abate a bad fungus disease of turf, known as brown spot, in experiments reported by Drs. John Monteith, Jr., and Mary E. Reed of the U. S. Department of Agriculture. The fungus thrives and spreads its death in grass when the air is hot and damp, and wind keeps it down, apparently simply by raising the evaporating power of the air to a point too high for the fungus to grow.

Whether golfers will presently see big fans set up alongside the greens on their favorite golf courses, where the brown-patch disease is most menacing, the report of the two Government researchers did not state. More practicable, probably, will be the cutting of air-drainage lanes through too-dense surrounding vegetation and other natural means of encouraging air circulation.

Science News Letter, January 11, 1936

GENERAL SCIENCE

Prof. E. G. Conklin Will Preside Over A.A.A.S.

See Front Cover

PROF. Edwin Grant Conklin, one of America's leading biologists and long a professor at Princeton University, was elected president of the American Association for the Advancement of Science. Dr. Conklin in being elected to this high scientific office succeeds Dr. Karl T. Compton, president of the Massachusetts Institute of Technology, and he will preside during 1936 and deliver the principal address of the 1937 Christmas meeting.

Newspapers can be the greatest aid to science if they treat science less like magic and are concerned more with truth than with sensationalism in science. This, in esssence, is the belief of Prof. Conklin.

In an exclusive statement to Science Service in response to the question, "What is the aim of science and how best may the newspapers of America said in attaining that aim?" Prof. Conklin said:

Spirit of Science

"The highest value and promise of science in the present state of the world will be found in the spread of the spirit, the methods and the aims of science among men.

"The spirit of science is freedom to seek truth in any field and to proclaim any view for which there is verifiable evidence. The methods of science are the appeal to phenomena, the rigorous distinction of fact from fancy, of reason from emotion, of truth from error. The aim of science is to understand and as far as possible to control natural phenomena for the promotion of human welfare and progress.

"Science cannot make satisfactory progress nor can human welfare be promoted in a non-scientific society. Newspapers and radio are the schools of the people and they can best help science and promote human welfare by following the spirit, the methods and the aims of science itself.

"Within recent years great progress has been made in these respects by some of our leading newspapers, but there are still many who treat science as a kind of magic and are more concerned with sensationalism than with truth."

Science News Letter, January 11, 1936

Heart trouble has increased 61 per cent. in this country since 1900.

BIOLOGY

Microscopic Animals Survive Sub-freezing Temperatures

ONE-CELLED animals of microscopic size remain alive and active at temperatures below the freezing-point of water, if the water in which they swim can be prevented from turning into ice. Experiments looking into their behavior under these circumstances have been carried out by Charles Wolfson, of Lawrence, Kansas, and reported before the American Association for the Advancement of Science. Mr. Wolfson published some of his results. (*Ecology*, October.)

Water can be chilled to temperatures well below ordinary freezing point (32 degrees Fahrenheit) by first drawing it into hair-fine tubes, and then cooling it. This is a trick long known to physicists.

Mr. Wolfson made up a number of such capillary tubes, and into them introduced the one-celled swimming animals known to zoologists as Paramecium, or slipper-animalculae, because of their curious slipper-like shape as seen under the microscope.

In their normal condition, these tiny creatures dart about incessantly, lashing themselves along by means of a fringe of minute fingerlike processes called cilia. As Mr. Wolfson lowered the temperature in his specially constructed apparatus, he could observe the point at which the animals first stopped swimming, then ceased even a feeble beat of their cilia. Then he warmed them up again and noted the temperatures at which they again went into action.

Temperature points for both stopping and resuming action differed with different specimens. In some, it was as low as 6 degrees Fahrenheit; in others, as high as 27 degrees. Most of the specimens stopped movement at about 21 degrees. In general, movement was not resumed on re-warming until the temperature was a little higher than it had been on stopping.

Some of the specimens "curled up and died" even after being warmed up again, but others recovered completely and seemed none the worse for their sub-icy experience.

Science News Letter, January 11, 1936

Master a
LANGUAGE
... in 3 months

By the Linguaphone Method you can acquire a sound speaking and reading knowledge of any modern, Oriental or Slavic language—in the privacy of your own home.

Send for FREE Book

Tells how Linguaphone was made by 150 of the foremost language teachers, why it is used in over 12,000 schools and colleges and by thousands of men and women.

LINGUAPHONE INSTITUTE
61 Rockefeller Center New York, N. Y.

ENTOMOLOGY

Grasshopper is Chivalrous And Protects the Female

GRASSHOPPERS are gentlemen, even if they are a bit flighty. Evidence that should convince any reasonable inquirer was offered to the American Association for the Advancement of Science, by Dr. E. D. Ball, of the University of Arizona.

Many of the short-winged grasshoppers of the west, Dr. Ball stated, have a peculiar method of protecting the females. The females are large, and cannot move with the quickness and agility of their smaller, more brightly colored mates.

"As one approaches," Dr. Ball continued, "the males leap up into the air, make a flip or two, alight and spring up again, thus distracting the eye from the obscure female hiding in the grass. Even if the female is forced to jump she alights and immediately hides, while a dozen males spring up and again distract attention."

Grasshoppers are not by any means all marauders and destroyers, any more than germs are universally disease-causers, Dr. Ball also pointed out. In a wide range of southwestern country which he has investigated, there are about 130 species of grasshoppers. Of these "only five or six would be classed as injurious to crops and scarcely a dozen more would be listed as of serious injury to the grasses of the range, leaving well over a hundred that are either beneficial or of little importance one way or the other."

Science News Letter, January 11, 1936

PLANT PATHOLOGY

Even Dead Trees Present Dutch Elm Disease Menace

EVEN dead elm trees are dangerous, where Dutch elm disease is about. At the meeting of the American Association for the Advancement of Science, Drs. R. P. True and E. T. Miller of the U. S. Department of Agriculture told of a cooperative survey on 750 dead and dying elms, within and outside the known elm disease area in the region around New York City.

Of all dead trees in sample plots in the known disease area, nearly ten per cent. were found to harbor the fungus of Dutch Elm disease, while no sign of the infection was found in dead trees in plots outside the elm disease area.

"The positive findings indicate the necessity of sanitation work in connection with the Dutch Elm disease eradication program," the scientists commented.

Science News Letter, January 11, 1936

MARINE ZOOLOGY

Oysters Filter Barrel Of Water Every Day

OYSTERS filter a barrel of water through their bodies every day, sifting out the minute plants which are their food, and obtaining the oxygen to keep their very modest vital fires alight. At the meeting of the Zoological Society of America, Dr. T. C. Nelson of Rutgers University told of his measurements of the efficiency of the oyster as a living pump.

The oyster's rate of handling water varies with the temperature. At about 50 degrees Fahrenheit very little water-filtering is done. Above this temperature the flow increases rapidly, to a maximum at about 85 degrees. During one seven-hour period, a single average-sized oyster, in water ranging between 75 and 80 degrees, filtered 111 liters of water—just about an even barrel.

Science News Letter, January 11, 1936

CONSERVATION

NATURE RAMBLINGS

by Frank Thone

The Deer Come Back

HOW promptly wilderness animals return, when wilderness itself is given a chance to return!

Deer, for example, have increased so rapidly in some parts of New England and Pennsylvania that farmers are complaining of them as pests. When conservationists in some other part of the country undertake to re-stock empty woods with deer, they are very likely to send to one of these regions for some of their surplus animals.

Among the factors making for this return of wildlife, three are outstanding. First, the short open season, coupled with the fact that a dead deer or other large animal is rather difficult to hide, has cut down shooting to a fragment of what it once was. Second, the merciless war which farmers and stockmen have waged on wolves, wildcats and mountain lions, as killers of their young livestock, has greatly reduced another cause of death among the wild animals. Perhaps this factor is even more important than the restrictions on shooting.

The third factor is a positive one: the large-scale abandonment of farms and their return to brushland, affording increased food and shelter to the larger game animals. Deer and their antlered kin are not primarily grazing animals, but browsers. They like the leaves and young shoots of bushes and saplings, and in winter, when snow lies too deep for them to find nature-cured hay on the ground, they can tide themselves over by gnawing bark off aspens and other trees.

All this has happened without any particular encouragement, except in such officially protected areas as the national parks and national forests. But now the federal and state governments are turning attention to the matter, with the deliberate expectation of getting more out of the so-called submarginal lands by using them as game-producing areas than as poverty-stricken (and chronically tax-delinquent) farm lands.

As a rule, the land so reclaimed for wilderness should never have been taken out of wilderness, at least for plowland. Almost always, the slopes are so steep that clearing and plowing them only invites disastrous water erosion, that strips the hills to barren clay subsoil or even to the naked bones of their rocks. Frequently also, the soil is not good enough for grain or truck crops, though still able to support the brushy growth that makes good browsing for the deer.

Science News Letter, January 11, 1936

ZOOLOGY

Bullsnake Halfway Ready To Hatch When Egg Is Laid

GOOD thing for the egg-consuming public that hens do not conduct their business the way bullsnakes do. If such were the case, finding chicks in soft-boiled eggs would no longer be a monopoly of the professional joke-smiths. For young bullsnakes are halfway ready to hatch by the time their mother lays her eggs.

At the meeting of the American Association for the Advancement of Science, Prof. E. P. Churchill and J. A. Harris of the University of South Dakota told of opening a number of newly laid bullsnake eggs, and finding a young snake in every one. Other eggs from the same batch, left to develop in the normal way, produced their snakelings at the end of eighteen days.

Science News Letter, January 11, 1936

PSYCHOLOGY

Prisoners Up For Parole Given Personality Tests

ILLINOIS is giving personality tests to prisoners applying for parole, it was revealed by Dr. Ferris F. Laune, of the Division of Pardons and Paroles of that state, in an address to the American Association for the Advancement of Science.

At present, the results are being used experimentally to "test" the test, but it seems so far as though such a test may eventually serve to show parole boards what prisoners may be expected to make good and which ones are likely to get into trouble again if released.

Inordinate desire for fine clothes, lack of love for relatives, interest in the "White Lights," tendency to sharp practices, argumentativeness: these are some of the personality traits which appear to make prisoners fail to make good on parole, Dr. Laune reported.

A prisoner at Joliet penitentiary whom one can call Jack Blank was described by Dr. Laune as an example. Johnnie had made up his mind firmly to "quit the racket" and was entirely sincere in this. But Johnnie was a "snappy dresser." He had excellent taste, and longed to have clothes made by a tailor who charges a minimum of $125 for a suit. He never paid less than $10 for a hat.

So Johnnie, despite his good intentions, was back in the hands of the law in just two months.

These and other significant attitudes of the prisoners are determined indirectly through questions that have been found experimentally to evoke truthful answers.

Science News Letter, January 11, 1936

SEX PRACTICE IN MARRIAGE

By C. B. S. Evans, M.D.

THIS little book—which can be read in half an hour—contains concentrated practical advice which would have saved many a marriage from going on the rocks, had husbands known its contents earlier. Its author is a member of the Faculty of Obstetrics and Gynecology at the Northwestern University Medical School, was a member of the White House Conference Committee on Maternal Care, and is in actual practice of medicine. Plenty of men think they "know it all," and blunder into the divorce court because they blundered clumsily in marriage and then accused someone else of frigidity. To use knowledge, you must first possess it. If something is wrong, maybe it is yourself, after all. If not, probably this isn't your book.—*Scientific American.*

FREE OFFER

Mail this coupon to

EMERSON BOOKS, INC.
333 Sixth Ave., N. Y. Dept. 301-S

Send me a copy of SEX PRACTICE IN MARRIAGE for free examination. I will pay $1.95 plus a few cents delivery charge, when the book arrives. I understand that if it is not entirely satisfactory, I may return it within 5 days and purchase price will be refunded.

Name.....

Address.....

☐ CHECK HERE if you wish to enclose only $1.95 with coupon, thus saving delivery charges. (Same money-back guarantee.)

•First Glances at New Books

Exploration

THE UNTOLD STORY OF EXPLORATION—Lowell Thomas—*Dodd, Mead & Co.*, 333 p., $5. Deliberately choosing to talk about the explorers that other writers have somewhat neglected, Mr. Thomas brings the attractiveness of novelty to his book. He tells of Joan Fernandez—no kith or kin of Juan Fernandez of Crusoe fame—who is pronounced really the first Robinson Crusoe. There is a tale of a Victorian gentlewoman, one Mary Kingsley, who went exploring West Africa and found cannibals less terrorizing than hansom cabs in traffic. There is "the greatest living explorer," and "the mystery of Lapérouse." Lively illustrations by Kurt Wiese add to the text.

Science News Letter, January 11, 1936

Physics

THE CATHODE-RAY TUBE AT WORK—John F. Rider—Pub. by author, 1440 Broadway, New York—326 p., $2.50. Theory and applications of the cathode ray tube for use of technicians in the industry. For its specialized field it stands where the many radio service men's handbooks stand in the field of radio and radio set repairing.

Science News Letter, January 11, 1936

Mythology

THE WORLD OF MYTHS—Frank Chapin Bray—*Crowell*, 323 p., $2. This little dictionary is aptly described by its author as a "Who's who in mankind's mythology." Briefly he sums up the career and identity of each noted figure and symbol. The familiar Greek and Roman gods and legendary heroes are here, but also those of Chinese, Egyptian, Persian, Hindu and Celtic myths, to name only a few. Primitive mythologies are not overlooked, from the Pacific Isles to Africa.

Science News Letter, January 11, 1936

Ethnography

WINTU ETHNOGRAPHY—Cora Du Bois—*U. of California Press*, 147 p., $1.75. A study of the cultural status of Indians of the hill country in northern California.

Science News Letter, January 11, 1936

Food Legislation

FOODS AND THE LAW—Alexander P. Blanck—*Peter Smith*, 246 p., $2.50. A lawyer explains in this volume the various United States laws dealing with foods and food products. The book is simple enough for the layman to understand and should be helpful to the housewife as well as to retail grocers, wholesale food dealers, restaurant and hotel proprietors, camp directors or others buying foods in large quantities. Even the reader who does not have any direct concern with food purchasing, distributing or preserving will be interested in this clear explanation of the reasons behind court actions that frequently are reported and discussed in newspapers and current magazines.

Science News Letter, January 11, 1936

Psychology

FOR STUTTERERS—Smiley Blanton and Margaret G. Blanton—*Appleton-Century*, 191 p., $2. The authors state that this book is "not primarily for parents or for teachers, although certain chapters have been addressed to them; nor for physicians, although if they find it suggestive we shall be grateful. But it is for those people with the symptom called stuttering, whom we feel to have been too long neglected." The senior author is assistant professor of clinical psychiatry at Cornell University Medical College, and the book is written from the point of view of medical psychology.

Science News Letter, January 11, 1936

Engineering

UNDERGROUND RAILWAYS—Vernon Sommerfield—*Thomas Nelson*, 116 p., $1. Readable account of the origins and operation of London's subway system. For American consumption one would like to have a similar book on New York and other cities but in general the principles of operation are not greatly different in England and the United States.

Science News Letter, January 11, 1936

Medicine

RADIUM TREATMENT OF SKIN DISEASES, NEW GROWTHS, DISEASES OF THE EYES, AND TONSILS—Francis H. Williams—*Stratford*, 118 p., $2. The author gives the results of his thirty years' experience with radium. The book is for physicians, radiologists and students of related sciences.

Science News Letter, January 11, 1936

Science

THE NEXT HUNDRED YEARS: THE UNFINISHED BUSINESS OF SCIENCE—C. C. Furnas—*Reynal & Hitchcook*, 434 p., $3. Brilliantly written popular survey of science from ability and abrasion to zoology and Zworykin. Because of its broad scope it naturally misses some things and treats topics discussed in brief fashion but the provocative style keeps the reader turning pages to see what comes next. The following statement discussing science and religion will illustrate the point. The four aces of modern popular celestial physics, Compton, Eddington, Jeans and Millikan, are willing to mix one part deity and one part data to make their hypotheses; but that does not prove anything except that their boyhoods were spent in religious atmospheres, as their biographies readily show.

Science News Letter, January 11, 1936

Photography

TOURING THE ANCIENT WORLD WITH A CAMERA—C. G. Holme and W. Gaunt—*Studio*, 120 p., 73 illustrations, $3.50 paper, $4.50 cloth. Lovely and unusual camera studies and word pictures of Old World places—Genoa, for example, Istanbul, Rhodes, Damascus, Athens, and Giza. Following the book and its impressionistic accounts in order provides a tour of the main things that a tourist sees on a journey around the Eastern Mediterranean.

Science News Letter, January 11, 1936

Physiology

THE GROWTH OF THE SURFACE AREA OF THE HUMAN BODY—Edith Boyd—*Univ. of Minn. Press*, 145 p., $5. A contribution to the study of anatomy and development, of value to scientists but too technical for lay reading.

Science News Letter, January 11, 1936

Photography

PHOTOGRAPHIC HANDBOOK—Sigismund Blumann—*Photo Art Publisher*, 183 p., cloth, $1.50, paper, $1. Compact volume giving informatinn on the developing and printing of pictures, arranged for easy reference.

Science News Letter, January 11, 1936

Science News Letter will secure for its subscribers any book or magazine in print which was published in the United States. Send check or money order to cover regular retail price ($5 if price is unknown, change to be remitted) and we will pay postage in the U. S. When publications are free, send 10c. for handling. Address Book Dept., Science News Letter, 2101 Constitution Avenue, Washington, D. C.